**FOREIGN
BROADCAST
INFORMATION
SERVICE**

JPRS Report

Telecommunications

JPRS-TTP-87-020

10 NOVEMBER 1987

TELECOMMUNICATIONS

.

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FRANCE'S SPOT SATELLITE TO BENEFIT EAST AFRICA

Nairobi KENYA TIMES in English 14 Jul 87 p 12

[Text] THE Spot 1 Earth observation was successfully launched in the night of 21st to 22nd February 1986, placed in orbit by Ariane satellite launcher from Guiana SPACE Centre, in French Guiana. The following day, February 23rd, SPOT shot its first images from Western Europe and North Africa; these were received at the -AISSAGUEL - ISSUS Station near Toulouse (France) and immediately anlysed by the SPOT project engineers and SPOT IMAGE Company.

They confirmed the excellent quality that was expected from the design features of SPOT's observation intruments.

Presentation

With the presentation of these images to the international press on February 22nd and the perfect operation of both the statellite and the ground facilities since the launch. The total success of this ambitious project begun eight years ago was confirmed.

On May 6, 1986, Centre National d'Etudes Spatiales (CNES) declared the SPOT satellite system operational.

The transfer to operational status took place as planned two months after launch of the MATRA — built satellite by ARIANE. Assessment of spacecraft performance and testing of the image receiving stations (in France), Sweden, Canada and Bangla-Desh)

and the data processing and image recording facilities (the Space Image Rectification Centre at the Toulouse Space Centre and at KIRUNA as well as at SPOT IMAGE, have taken place during this two-month period.

Quality

The geometric and radiometric quality of SPOT IMAGES was very high from the outset.

The combination of all archived scenes received in the receiving stations mentioned above, throughout the world, were about 700,000 in 1986-1987.

In a far future, other receiving stations: Hyderabad (Indian), Japan, China, Pakistan, Saudi Arabia, Canarias Islands, Brazil and Australia will be able to receive and disseminate the useful datas for surveys in. Catography, Vegetation, Forests, Rangelands, Agriculture Land use mapping, Hazard mapping, Desertification, Soils urbanism, etc...

A prefaisability study for a receiving station in Nairobi will start soon and hopefully in no distant future, Eastern African countries (Kenya, Ethiopia, Somalia, Djibouti, Uganda, Rwanda, Malawi, Seychelles, Comoros, Zambia and parts of Sudan, Zaire, Angola, Zimbabwe, Mozambique and Madagascar) will be covered and will be able to receive directly the Earth observation satellite

Data from SPOT and other Earth observation satellites.

In Kenya, application of Remote Sensing Technology under the French Technica' Co-operation started in 1979 in KREMU (Ministry of Planning and National Development) and now referred to as the Department of 'Resources Surveys and Remote Sensing (DRSRS).

In KREMU, some of the activities for which Remote Sensing techniques have been used cost effectively include the changes in forest cover all over the country, including mangroves, land use, vegetation and rangeland mapping, maize and wheat forecast, crop acreages, urban development and human settlement, etc...

Scenes

About five hundred scenes since March 14, 1986 have been recorded over Kenya (see map). It means that about 60 per cent of the territory (mainly high potential area) is now registered and some of these are available in KREMU/DRSRS.

In addition training programmes in French and English languages are conducted by the RCSSMRS for the benefits of all countries in Eastern African countries as part of the transfer of technology in the field of Remote Sensing.

Number of Recorded Scenes
Total   111 scenes/230 scenes overall

9274

2
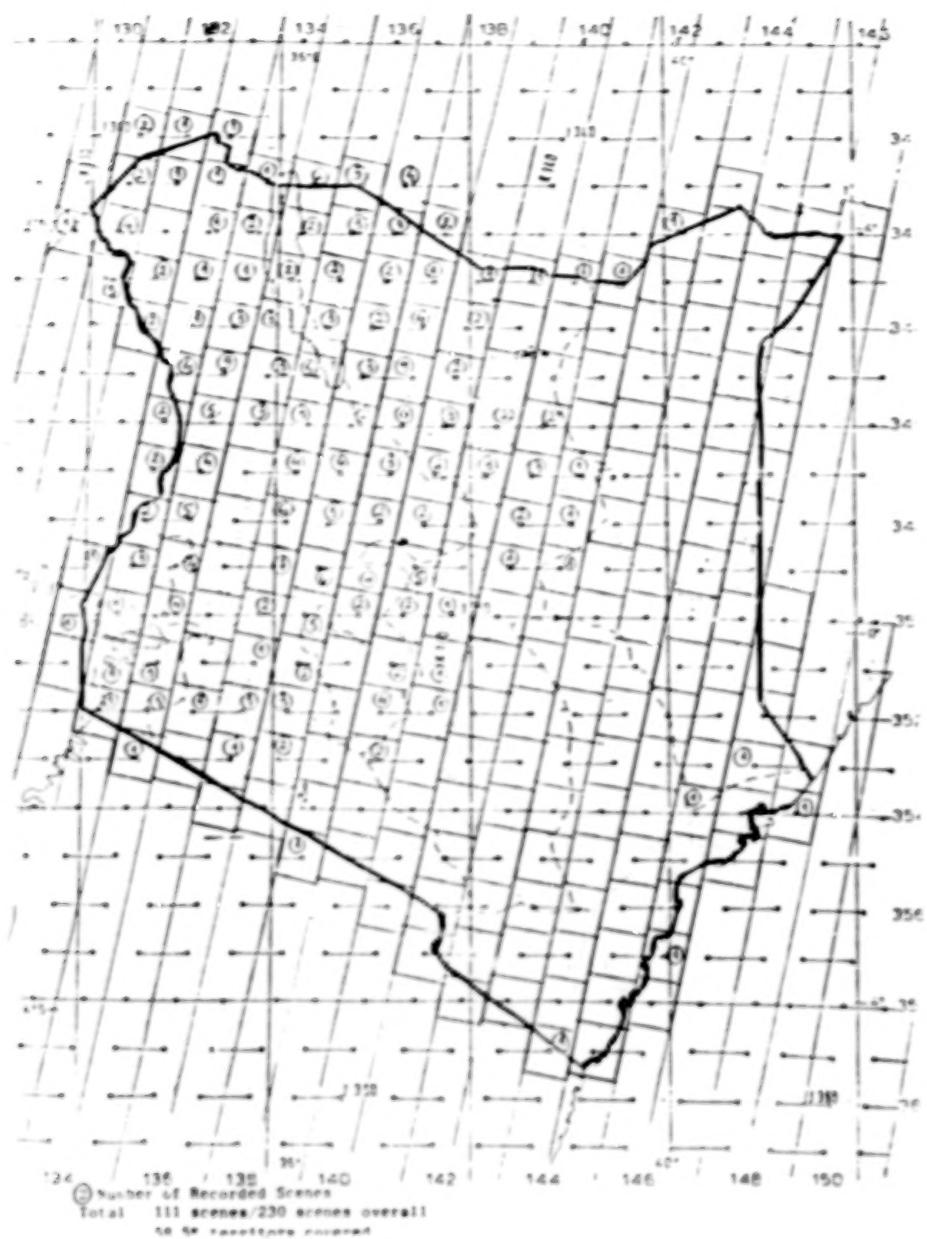
NEW ALTECH MERGER PUTS IT IN WORLD COMPETITIVE POSITION

[Article by Heloise Henning]

[Text] ALTECH Group has merged its two telecommunications divisions, STC and Teltech, to form a giant with a total asset value of R340m and combined turnover of R410m a year. The merger took effect on August 1.

This is the first time Altech has divulged the asset value and turnover of these two divisions. It is believed to be SA's largest telecommunications organisation, and its size puts it in a world competitive position.

Multinational Alcatel NV of Europe is supporting the merger by exchanging its 50% interest in Telecommunication Technologies (Pty) Ltd (Teltech) for a R32m minority investment in the new merger. The merger will trade under the existing STC name.

Alcatel, regarded as the second largest telecommunications group in the world, hereby diversifies and extends its interest in the SA electronics industry at a time of disinvestment in SA, Altech says in a Press statement.

Alcatel is a subsidary of French-based Compagnie Generale d'Electricite. Senior executive Pierre Guichet joins the board of the new STC.

Altron group executive chairman Bill Venter has been appointed executive chairman of the new STC with Altron's deputy chairman Don Snedden as MD.

Snedden said the combined unit was expected to benefit by being able to compete for turn-key telecommunications projects against all the world's major companies.

The combined divisions — manufacturers of telephone switching, transmission equipment and data communication systems — employ more than 3 300 people in Boksburg. Working for the Post Office, these divisions have been proven nationally and internationally.

Until now, Altech, through Teltech, has been in a joint venture with the CGE to manufacture locally and supply the SA PO with digital electronic switching exchanges under the SA128E brand name.

STC has represented the American ITT in SA for 60 years, mainly in fibre-optics, data transmission and digital microwave systems.

Rationalisation of the companies was in line with government and PO requests for rationalisation in the telecommunications industry, Snedden said. He added the strengthened positions would add to future "rationalisation" in local industry.

"The move is also in line with what is happening all over the world, where markets tend to be shared by not more than two or at best three major suppliers."

CGE, of which Alcatel is a subsidiary, and ITT merged late last year to form the $12bn sales-per-year company.

9274

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GUANGDONG OFFICIALS REPORTED TO BAN HONG KONG TELEVISION

55500006 Hong Kong SOUTH CHINA MORNING POST in English 13 Aug 87 p 1

[Article by Chris Yeung]

[Text] GUANGDONG authorities have ordered the dismantling of hundreds of thousands of "fish-bone" television antennae tuned to Hongkong stations, to guard against the intrusion of bourgeois liberalism.

Party officials fear the programs might influence visitors from other parts of China who will gather in Guangzhou in November for the sixth annual National Games.

The dismantling will begin this month.

A provincial government source said yesterday: "The order is, to a certain extent, related to the campaign against bourgeois liberalisation.

"We have an open policy but in the meantime we are also resisting against unhealthy things.

"We have always discouraged people here from watching Hongkong television programs.

"The authorities issued an order recently on the dismantling of all the antennae. The broadcasting of mainland stations has been interrupted by the frequency of Hongkong stations.

"Hotels that cater to foreign guests will not be affected."

Almost all the families in the southern part of Guangdong can tune to Hongkong stations, whose programs are more popular than the mainland productions.

Many families in Guangzhou have in recent years spent hundreds of dollars to install "fish-bone" antennae that beat wave interruptions from the Guangdong TV station and so receive Hongkong programs.

One man told the *South China Morning Post* recently: "They said the antennae that are not installed properly have been a potential threat to the safety of people nearby and affected the appearance of the city.

"It's not true. They are afraid of the influence of such programs on the many mainlanders who come from the north during the National Games.

Following the open policy of China in the early 1980s, the provincial leadership has been divided over whether to allow the 60 million mainlanders in the province to watch Hongkong television programs.

Conservatives are said to have gained the upper hand in the recent debate.

Some people have suggested that the student demonstration at the Zhongshan University in November last year might have been sparked off by television reports of student protests in other parts of China.

"Officials are angry that people learned the news (of student demonstrations) from Hongkong instead from mainland media," another source said.

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WRITER TRACES STEPS LEADING TO NEW BROADCAST AUTHORITY

55500002 Hong Kong SOUTH CHINA MORNING POST in English 29 Aug 87 Supplement p 1

[Text]

THIS week the Government announced the new Broadcasting Authority's line-up, capping a tempestuous two years for broadcasting in Hongkong. The Authority, which will play a key role in the future manner and quality of Hongkong broadcasting, was born out of a recommendation by the controversial Broadcasting Review Board, which shocked media moguls, advertising groups and private citizens alike with its radical proposals. DAVID LAGUE looks back at the path that has led to the creation of a broadcasting authority.

THE new Broadcasting Authority, Hongkong's radio and television watchdog, survived the media outrage that buried the Broadcasting Review Board's more radical proposals.

The 16-member board under Mr Justice Noel Power recommended that the Government scrap the present Television Authority and replace it with a more wide-ranging Broadcasting Authority.

It would have sweeping powers to regulate and police the broadcasting industry.

This week, the Government appointed former Broadcasting Review Board (BRB) member and Executive and Legislative Councillor Allen Lee to head the new authority.

Nine non-official members and three Government members were also appointed.

A ban on tobacco advertising and an independent board of governors for Radio Television Hongkong (RTHK) were the only other major proposals from the board's controversial 1985 report to escape the Executive Council chopping block.

The shock proposal of the 26 recommendations included in the BRB's 564-page report was that broadcasting giant and money-spinner TVB should be forced to unload its lucrative subsidiary companies.

It said TVB dominated the industry with an unhealthy 85 per cent audience share.

The profitable subsidiaries were one reason for this dominance and the BRB believed that TVB had contravened the Television Ordinance, which stipulated that television licencees' sole business had to be TV broadcasting.

It was also proposed that TVB and ATV be forced to give up valuable prime-time to a new-look, independent RTHK from next year.

RTHK would have its own charter as an independent statutory corporation and a board of governors appointed by the Governor.

The BRB had considered changes that could reshape RTHK into an independent "BBC of the East," with its own channel.

Costing an estimated $196 million, the fifth channel would have offered Hongkong viewers more choice in educational and minority programs and created jobs for independent producers.

Advertising could have recouped an estimated $83 million and a sales tax plus a household levy might have covered the

rest; but these estimates were uncertain.

There was also difficulty in finding an available broadcasting frequency.

The BRB rejected the fifth channel proposal and decided to opt for what it called a "service-sharing option," where RTHK would get air-time on ATV and TVB and collect the advertising revenue earned.

This was believed to be the least complicated plan to give RTHK a higher profile, independence and a chance to grab a bigger audience.

Under this recommendation, RTHK would have monopolised both of the Chinese channels from 7 pm to 8 pm on weekdays and for two hours before 7 pm or after 11 pm on Saturdays and Sundays.
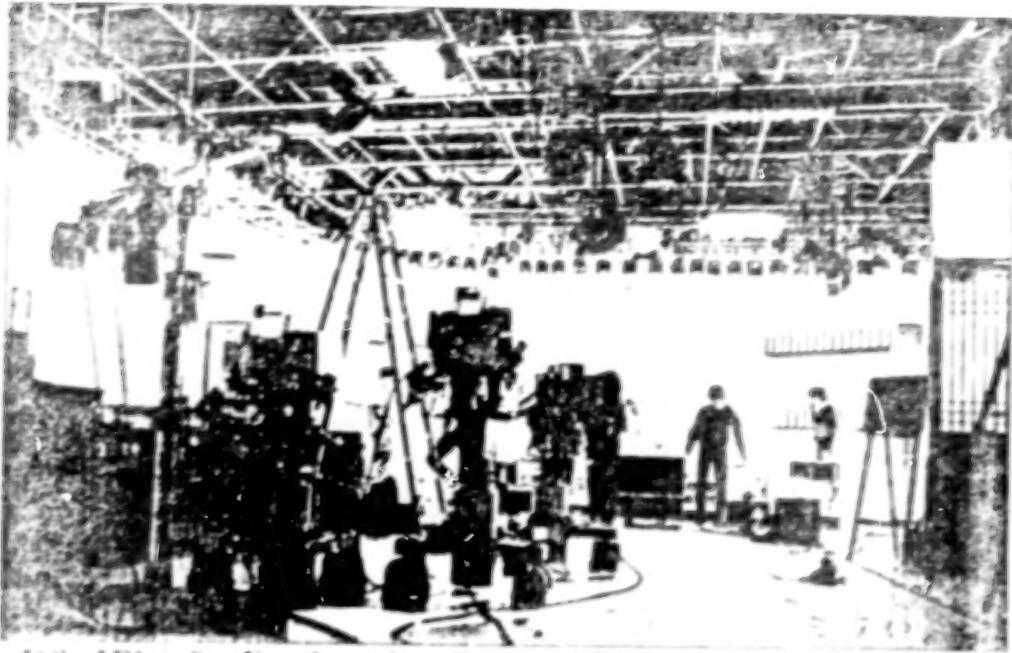
At the ATV studios: Now the station will come under the scrutiny of a new authority.

WHO'S AMONG THE LINE-UP IN THE NEW AUTHORITY

Rosanna Tam

Ira Kaye

Lo King man

Stan Cheung

RTHK's English television service would be restricted to two hours on both commercial stations on Saturdays and Sundays between 6 pm and 10 pm.

It was also recommended that RTHK radio be allowed to sell advertising time and program sponsorship, apart from news bulletins and that a Chinese and an English service be broadcast 24 hours a day.

The Government would continue to fund RTHK's radio arm until it became self-supporting.

In urging a ban on tobacco advertising from next year, the BRB said it was unable to ask the community to entertain the Government's campaign to curb smoking if it allowed cigarette advertising.

This was expected to cost ATV and TVB $100 million.

Other controversial recommendations that rocked the broadcasting and advertising industries included:

● Extending the partial ban on television liquor advertising.

● Slashing the current 15-year commercial TV licences to eight years.

● Allowing advertising breaks in news bulletins.

● Increasing advertising time from 10 to 12 per cent of air-time.

● Maintaining TV censorship controls.

● Opening the way for cable TV, micro-wave broadcasting and multiplex TV services and setting up community radio stations.

Predictably, there was an outcry from TVB, ATV and the tobacco industry after the BRB report was leaked to the *South China Morning Post.*

Stockholders watched the market anxiously as TVB shares dropped.

Other community groups also objected to some of the recommendations, accusing the BRB of "social engineering" and meddling with private enterprise.

TVB chairman Sir Run Run Shaw went further, slamming the report because it "lacked credibility."

"The suggested changes to Hongkong's current successful broadcasting system are radical and untested," he said.

"They are unrealistic and foreign to Hongkong.

"They are experiments in social engineering which attempt to interfere with the freedom of choice of everyone in Hongkong.

"They ignore financial ramifications and business common sense.

"If the Government wants RTHK to make more programs, it should have another channel of its own rather than taking away our prime time."

He rejected the BRB's suggestion that TVB's structure had violated the Television Ordinance.

"HK-TVB became a public company in 1984 with this structure after receiving approval from the Government authorities who were fully aware of the company's structure and operations," said Sir Run Run.

"There was no suggestion by Government at that time or since that the company has not acted in the spirit of the Television Ordinance.

"The reference by the review board to TVB as a monopoly is not only totally inaccurate, given the obvious competition between the two licencees, but is an unwarranted attack on the successful level of ratings which TVB has achieved."

ATV chairman Mr Deacon Chiu also launched a scathing attack on the report's proposals and threatened to sell out if cigarette commercials were banned.

He said a tobacco advertising ban would slash 10 per cent of ATV's revenue and would put the station under renewed financial pressure after it had spent millions to improve programs.

"I will consider selling off my shares, given a reasonable deal," he said.

The advertising industry also went on the attack and fired a broadside at the BRB's report.

The Association of Accredited Advertising Agents of Hongkong (the so-called 4 As) rejected all the major recommendations, labelling the report as "nonsense" and "a monument to misplaced zeal."

The advertising group's chairman, Mr Alan Farrington, said: "We currently have a broadcasting industry which may require some fine-tuning in some areas of programming but which most people support and enjoy and which has boosted Hongkong's international reputation immeasurably without costing the taxpayers a cent.

"A broadcasting industry which survives in the free market with positive non-intervention of the Government and with the morality and guidance to regulate itself is the sort of broadcasting industry with which Hongkong should face the 1990s."

Amid the heated public debate on the report, the BRB was also criticised for the scanty attention it paid to the complex cable television issue.

BRB members, including Mr Justice Power, defended the report, saying that it had conformed to the terms of reference.

However, the Government asked Administrative Services and the Information Branch to add to the report.

Attorney-General Michael Thomas unveiled the Government's response to the report late last year after intensive lobbying from vested interests and pressure groups.

The Government decided that:

● An independent broadcasting authority would be set up to police the industry.

● A tribunal would be set up within the authority to deal with public complaints on program and advertising quality.

● A total ban on tobacco advertising and sponsorship on television and radio would come into force in four years.

● The licences of the two television stations, which were scheduled to expire in December next year, would be extended for a further 12 years.

● The public would continue to fund RTHK.

● TVB and ATV would have to surrender some prime time to RTHK programs, but without handing over any advertising revenue.

● TVB would be allowed to keep its offshoot companies.

● Tenders would be called for cable television licences.

Mr Thomas said the Government had rejected the BRB's recommendation for a separate, independent tribunal to handle complaints and disputes in the industry.

He ruled out issuing extra licences when the existing franchises expired at the end of next year, saying that costs would deter outsiders applying for licences.

ATV and TVB would be offered 12-year franchises but licence conditions would be revised and these franchises would be subject to review in 1994.

The 12-year term would "give the broadcasting industry the confidence to plan ahead and to make the necessary investment to improve the quality of television, so that the industry can face up to the drastic and rapid political changes in the years ahead," he said.

TVB would be allowed to keep its subsidiary companies, because "the Government is reluctant to be thought to be penalising commercial success."

Existing policies and the spirit of existing laws would continue to govern the structure, ownership and control of TV licences but the new broadcasting authority would have the power to examine the books and accounts of TV stations and their associated companies.

Mr Thomas said the Government was unable to accept suggestions that RTHK be made financially viable and added that there was little support for the proposal to give RTHK television prime-time.

After intense soul searching and debate, it had been decided to introduce an independent, statutory board of governors for RTHK.

Governors would be appointed from the community and the Government to ensure that the board reflected public views and maintained its independence.

RTHK's duty to inform, educate and broadcast news and current affairs would be laid down in new laws.

"RTHK must continue to be and be seen to be a balanced and objective public broadcaster," Mr Thomas said.

Clauses giving RTHK more opportunity to broadcast its programs in commercial television prime-time would be written into the new TV licences.

The Government later decided to appoint an independent consultant to review plans for cable television services.

OPPOSITION TO BRITISH TELECOM NETWORK IN HONG KONG

55500003 Hong Kong SOUTH CHINA MORNING POST in English 31 Aug 87 p 3

[Text]

CABLE and Wireless director Mr Eric Walker has warned of the consequences of British Telecom being allowed to operate a second telecommunications network in Hongkong, following a barrage of criticism in the United Kingdom of British Telecom's standards of service.

Earlier this month, British Telecoms chairman Sir George Jefferson had to reply to critics of the company's services in the UK press.

Mr Walker claimed: "If BT brings the same standards it offers in the UK to Hongkong, we will run rings around them."

The Hongkong Government is about to appoint a firm of independent consultants to look into the question of cable television and whether Hongkong should have a second network for this and other telecommunications services.

At present the Cable and Wireless subsidiary Hongkong Telephone has the monopoly in providing the telecommunications network.

British Telecom, which is part of the Hutchison CableVision consortium, is bidding for a second network for cable television and other telecommunications services.

Mr Walker took over as Far East director of Cable and Wireless from Mr Rod Olsen in April, and this is the first time he has publicly joined the telecommunications debate.

He said British Telecom chairman Sir George Jefferson was putting forward the same argument in the United Kingdom as Hongkong Telephone was here — for a sole network provider.

In a British Telecom briefing for parliamentary members of the information technology committee, Sir George said: "I am not convinced that the best national interest is served by actually saying you are going to capitalise the local network twice, because it is a very large capital network, and one must ask if that is really the best way of using our resources.

"I believe, in fact, that if we all put our minds to it, it should be possible to evolve a form of operation in which there is competition for the provision of services but without necessarily the huge capital investment in duplication of what is already a significantly under-utilised resource."

The concept of one network open to other companies is the same as Hongkong Telephone has been putting forward.

Much of the recent criticism of British Telecom in the UK has been centred on the time taken to get a telephone line. Sir George said the ideal waiting time was eight to 10 days although this could always be met.

Mr Walker claimed that in Hongkong the average was less than five days.

He said a second network would mean higher telephone charges since: "If there was a second network it would be unreasonable for he Government to say to Hongkong Telephone, 'You must continue to operate under a scheme of control'."

He added: "We are not against competition. It was Hongkong Telephone that asked the Government in 1983 to introduce competition in providing services on the telephone network."

Mr Walker said he personally felt Hongkong Telephone's participation in cable television through the consortium had blurred the issue of a second network, but that Hongkong Telephone had succeeded in starting the cable television ball rolling.

Criticism of British Telecom has been at its worst in the City of London, the group's biggest district and the one where technological change is most concentrated.

Sir George acknowledged this month that the company had "been the subject of numerous attacks" but claimed: "At no time in the history of telecommunications in Britain has more been undertaken towards making major improvements in all aspects of our service and efficiency."

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GOVERNMENT ANGERED BY MACAO TELEVISION PLANS

[Article by Ann Quon]

[Text]

THE Hongkong Government may lodge an official protest with Macau over its television station's plans to broadcast into Hongkong.

A series of informal meetings have already been held with Macau administrators who are aware that a $30 million plan to boost transmission power to enable Macau programs to be received by Hongkong viewers could undermine Hongkong policies.

It is understood that the Macau Government has been made fully aware of the territory's concern.

But Macau has so far failed to provide any assurances.

One of the delays is said to be with new Governor

Carlos Malancia, who has yet to give the Hongkong Government any indication on where he stands on the matter.

Until assurances are given, Hongkong authorities could decide to take steps to scramble Macau transmission signals and thwart plans to begin broadcasting to Hongkong homes by November.

Hongkong does not have the authority to prevent Macau from beaming its programs to the territory. However, local administrators could decide that for technical reasons Macau broadcasts interfere with Hongkong's own television

and could start scrambling signals.

This decision rests with the Administrative Services and Information Branch which is responsible for broadcasting policy.

One of the Hongkong Government's fears centres on tobacco advertising.

The Macau Government-owned Teledifusao de Macau (TdM) stands to gain an estimated $90 million a year in tobacco advertising when Hongkong's own ban on television and radio tobacco advertisements comes into effect in 1990.

Macau has no plans to ban tobacco advertising from either television or radio and this could put the Hongkong

Government in an embarrassing position as it is committed to pursuing an anti-smoking policy.

The tobacco industry has already served notice that it would sidestep the Hongkong ban by diverting its tobacco advertising money to TdM.

The conflict between the two Governments has been sparked by the Macau decision to boost TdM's power output 25-fold by the end of the year.

This would allow up to three million Hongkong viewers to tune into Macau programs.

The Hongkong authorities also are worried about

TdM's more relaxed approach to censorship, which Macau says it has no plans to tighten up.

Currently, all Hongkong television programs are vetted by the Television and Entertainment Licensing Authority.

Although TdM administrators have said they would respect the rules and standards of Hongkong censorship, they also said they would not tighten censorship just to meet Hongkong requirements that currently bind ATV and TVB.

Hongkong has already approved TdM plans to build a relay station which would enable it to broadcast its signals to the territory.

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ADVANCED DIGITAL DATA NETWORK FOR HONG KONG TELEPHONES

55500001 Hong Kong SOUTH CHINA MORNING POST in English 25 Aug 87 Supplement p 1

[Text]   HONGKONG Telephone's datacom service will install advanced digital data network equipment, allowing radically faster transmission rates than the territory has known.

Supplier Datacraft Hongkong declined to specify contract figures but indicated the contract was worth several million US dollars for each of the two years.

Under the agreement, Datacraft will manufacture and supply the system, including NTUs (network terminating units) based on ISDN standard (Integrated Services Digital Network) processor chips.

The NTU is specifically designed for Telco's requirements, Datacraft says.

As well as overall project management and manufacturing the NTU's, Datacraft will also supply T-1 multiplexers and the digital cross-connect switching systems and network management computers manufactured by Tellabs, a Chicago-based company which manufactures both voice and data systems.

Tellabs is a major supplier to AT&T Information Systems, Telecom Canada and Northern Telecom Inc.

The company says that besides increased transmission speeds along networks, quality should improve dramatically too.

Mr Keith Brothers, sales manager of Datacraft Hongkong, said: "The system will allow Hongkong Telephone to make much faster provision of network services from 1,200 bps all the way up to 1.5 Mbps.

"Network Management facilities will also make fault detection and recovery more timely and will therefore increase network availability to users," he said.

Users can obtain the data transmission rates they require, from 1,200 bps to 64,000 bps, through DataCom Services, by downstream loading instructions from the Network Management computer, without changing or modifying equipment.

Network Management facilities will also be extended at a later stage to increase the degree of network control available to the user.

"Digital technology allows many beneficial features to be incorporated in this system," Mr Brothers said.

"For example, the digital cross-connect switching systems allow fast establishment and reconfiguration of channel connections," Mr Brothers continued.

Datacraft says that in the first stage of the installation – expected to be on service at the end of the year – 1,200 links will be offered, each capable of 64 Kbps.

It says these links will be connected through 14 T-1 multiplexers and others in Kowloon.

By mid-1988, the network will grow until it consisted of 35 T-1 multiplexers, he said.

Mr Roy Ellyatt, marketing manager of Hongkong Telephone's DataCom Services said the new network would offer users both increased functionality and a more cost-effective means of communication.

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BRIEFS

FREEPHONE TO U.S.--Telecommunications between here and the U.S. will ring up
a significant addition next month. For, as from September 1, Hongkong Tele-
phone will provide the international freephone service--commonly known as toll-
free-service--to all states in the U.S. According to Alice Yau, manager of
Telco's group public affairs, the U.S. will be the first country to be served
by Business Link with Hongkong. Connection between here and the UK and Aus-
tralia is expected to become effective before the end of the year, and Telco
is also currently negotiating with Japan to provide similar services. [By
Sofia Morgan] [Excerpt] [55500005a Hong Kong HONGKONG STANDARD in English
26 Aug 87 Supplement p 3]

CABLE TELEVISION STUDY--The Finance Committee has approved the expenditure of
$2.4 million for a consultancy study on cable television and its implications
on telecommunications. Deputy Secretary for Economic Services, Mr Rafael
Hui, yesterday confirmed a report in the Chinese press that the money had
been approved recently. But he stressed that the money was only a provision-
al estimate and that the actual cost of the study might be more. Included in
the estimate is a sum of $100,000 which will enable the Government to invite
experts from the Office of Telecommunication (OFFTEL) in Britain to give a
second opinion on a report to be written by the consultant firm. OFFTEL is
an independent watchdog that looks after consumer interests and is responsi-
ble for shaping telecommunications policy and licensing matters. Mr Hui said
the Government had all along been seeking OFFTEL's advice on the cable TV
issue and, therefore, wanted the body to give further advice on the consul-
tants' recommendations. However, he was tight-lipped on which firm had been
awarded the contract. He said a final decision would be made soon. The firm
was expected to be named next month and would submit a report in three months'
time. [Text] [55500005b Hong Kong HONGKONG STANDARD in English 29 Aug 87
p 5] /7358

CARIBBEAN RADIO, TV IN JOINT EFFORTS; CANA GETS FRG AID

Special Radio Hookup

55400125 Bridgetown CANA in English 2327 GMT 29 Jul 87

[Text] Bridgetown, 29 Jul (CANA)--The most extensive radio link up in the
Caribbean will be mounted tomorrow night when the Barbados-based CARIBBEAN
NEWS AGENCY (CANA) hosts a discussion programme on disaster prevention and
preparedness.

Seventeen regional radio stations will carry live the broadcast that will
originate in the studio of Canaradio, the radio arm of the agency.

"As far as we are aware, this is the first time that so many Caribbean sta-
tions spread over such a wide area will be participating in the transmission
of a live radio programme," CANA's general manager, Mr Harry Mayers, said.

The one-hour programme, scheduled to start at 8 p.m. (Barbados time), has
been organised in collaboration with the Pan-Caribbean Disaster Preparedness
and Prevention Project (PCDPPP) to sensitize to regional people about how to
cope with natural disasters.

The link-up will in effect bring together radio listeners in Anguilla,
Antigua, Bahamas, Barbados, Dominica, Grenada, Jamaica, Montserrat, St Kitts,
St Lucia, St Vincent, Trinidad and Tobago, Tortola and the Turks and Caicos.

Arrangements have been made for recordings of the discussion to be aired on
radio stations in Saba and St Eustatius.

The link-up will involve the newly appointed project manager of PCDPPP, Mr
Franklin J McDonald, who will make his contributions from his base in Antigua.

Three other participants will make their contributions from the studio of
Canaradio in Barbados. They are Mr Ronald A Williams, area engineer advisor
of the Pan American Health Organisation; Mr Jerome Lloyd, national disaster
coordinator for Dominica; and Miss Judy Thomas, supervisor of emergency ser-
vices of the Central Emergency Relief Organisation (CERO) in Barbados.

OECS TV Magazine

Bridgetown CANA in English 1519 GMT 6 Aug 87

[Text] Port-of-Spain, 6 Aug (CANA)--A local video production house, Banyan, says it has completed a half-hour magazine programme put together with six television units in the Eastern Caribbean.

The programme, Caribbean Vision, contains features from the region put together during a one-year UNESCO-sponsored project aimed at upgrading television production capabilities in the area.

Participants were Banyan, SUG-TV in St Vincent, Helen TV Systems in St Lucia, Dominica's Video One, ABS-TV in Antigua and Barbuda, Antilles TV, Montserrat, and ZIZ-TV in St Kitts.

Project co-ordinator Christopher Laird told CANA the programme will be shown by the six stations and had also been offered to Barbados, Jamaica and Trinidad and Tobago.

In the past, Caribbean productions have suffered from a sort of parochialism or more chauvinism where they say that if there's not enough of Trinidad in it, we won't show it, if its not enough Barbados, I'm sorry we won't show it. Well, there's none of Trinidad or Barbados or Jamaica in this programme but I think its of great interest to us all, Laird said.

CANA Aid From Bonn

Port-of-Spain DAILY EXPRESS in English 8 Aug 87 p 5

[Text]

THE Caribbean News Agency (CANA) has received TT$1,967,104.80 in funding following the signing of an agreement between the Federal Republic of Germany and the United Nations Organisation for Education, Science, Culture and Communication (UNESCO).

The funds in trust were donated by the Germans for the second phase of three projects concerning press agencies in the Caribbean, Latin America and West Africa and will provide CANA with the ability to create new press services in its region to achieve greater economic independence.

The Latin America Press Features Agency (ALASEI) will receive TT$786,884.40 to enlarge its correspondent network and to improve the agency's technical infrastructure. ALASEI specialises in feature coverage of economic and cultural developments in Latin America and the Caribbean.

The West African Region, comparatively less developed in terms of communications, will benefit from a West German contribution of more than TT$3,600,000. UNESCO hopes to strengthen the operations of national press agencies in eight countries and promote the creation of news agencies in five other countries of that region with the disbursement of these funds.

9274

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GOVERNMENT APPROVES 15-YEAR LICENSE FOR CABLE TV

Hamilton THE ROYAL GAZETTE in English 3 Sep 87 p 1

[Excerpts]

The days of unchallenged markets for ZBM television and the Island's video shops have ended.

Government yesterday agreed to Bermuda Cablevision, granting it a 15-year licence, and company boss Mr. Gavin Wilson promised some people will have 35 channels to choose from by Christmas.

One of the stations he's considering is a "home video" station which would allow people to dial up whatever video they want, paying on a per-view basis.

Cablevision will cost $19.95 per month for 12 channels, and will go up as blocks of channels are added. Mr. Wilson didn't have a figure for all 35 but said he was trying to keep it under $30.

That doesn't include pay-per-views.

The channels will include US networks NBC, ABC and PBS, but Mr. Wilson said he wasn't ready to announce the full lineup.

Cablevision is expected to start at Cable and Wireless in Devonshire and spread through the Island over roughly 15 months. Work is expected to start near the beginning of November. Mr. Wilson hopes the $7-million system will grow at five miles per week over Bermuda Electric Company poles.

He estimated the entire system would involve between 250 and 300 miles of line.

Fifteen foreign workers will carry out the work, stringing lines seven days a week.

"We've got to be very aggressive with the timing," he said. "We've got to make sure no grass grows under our feet."

He said he was counting on at least 35 percent of the Island's households subscribing to Bermuda Cablevision.

/8309
CSO: 5540/0001

GOVERNMENT PLANS RADIO, TV DIVESTMENT; OBJECTIONS RAISED

Seaga Statement

55400126 Kingston THE DAILY GLEANER in English 23 Jul 87 p 8

[Text] Following is the text of a statement issued yesterday by Prime Minister Edward Seaga on Divestment of the Electronic Media.

IN KEEPING with the policy first articulated by Government in 1980 and reinforced by several ministerial announcements since then, the Government has embarked on a programme of divesting to the private sector those public entities which, it is felt, can be better managed and better serve the public interest under private control.

Certain decisions were taken in 1985 whereby some services of the Jamaica Broadcasting Corporation (JBC) would be leased to private operators and a Public Broadcasting Corporation established to provide programming or radio and television in the areas of culture, public affairs, sports and education. The equipment and plant of the JBC was to be retained by a holding company established for that purpose.

Further refining of those decisions, taking into account the implications for ongoing involvement in maintenance and financing, has led to the proposals set out below with regard to the JBC's radio and television services.

Radio islandwide

The Radio Divestment Programme is predicted on the granting of five (5) Broadcasting Licences, as follows:

●● The present JBC Radio One, its physical plant, offices and equipment including transmitters which provide 24 hour island-wide coverage, will be sold to a licensee to operate an AM station, with FM rebroadcast, on a commercial basis.

●● The licensees would be required to divest 50% of their shareholding to the public at large within an agreed period after commencement of operations. Ownerships by ay one entity or connected entities will be limited to 10%. A period of four (4) weeks will be allowed for receipt of applications, that is, until August 21, 1987.

REGIONAL One (1) broadcasting licence will be issued for regional broadcasting. The area to be covered by the licence will be geographically defined in terms of transmission pattern. Programme and technical standards will be developed with the Broadcasting Commission.

●● The licence for regional radio will contain an option for extension of service to provide islandwide coverage four (4) years for commencement of regional operations.

RELIGIOUS One licence will be granted for island-wide broadcast of religious programming on FM. This service will be non-commercial, and all incorporated churches will be eligible to apply.

Public Broadcasting

The present JBC Radio 2 FM will be operated as a public broadcasting radio service. The service will offer educational, sports, culture and public affairs in its programming and will be allowed to accept sponsors only for major events. Otherwise there will be no commercials on public television.

SUMMARY (RADIO). Five (5) Licences

(1) Radio AM/FM Commercial Islandwide; (2) Regional —Commercial (regional coverage to be established); (3) Religious Licence Islandwide; (4) PBS Radio 2 —Government Islandwide; (5) RJR —See below.

Television

Three (3) television licences will be granted.

●● Commercial Television — a licence will be granted to a group of private investors who will be required to put together a plan to run a commercial TV station.

●● Fifty per cent (50%) of the ownership of this station will be held by corporate entities, with 50% to be divested to the public within an agreed period after commencement of operations. There will be a limit of 10% ownership by ay single entity or connected entities.

●● The standards for programming and technical operations will be developed with the Broadcasting Commission.

●● The licensee will commence operation with 70% coverage using the present JBC Standby transmitters, and will be required to achieve 10% coverage with their own transmitters within an agreed period.

PBS — TV — a licence will be granted for a Government-operated

second channel. In order to bring this channel into operation, much of the television facilities of the JBC, including main transmitters and present channel allocation will be retained and vested in a public company to be formed shortly — The Public Broadcasting Corporation.

This corporation will be responsible for broadcasting material in public affairs, education, culture and sports. (It will also own and operate the present JBC FM radio service as PBS — Radio.)

●● The Creative Production and Training Centre (CPTC) will become the production arm of PBS TV and Radio.

●● The Public Broadcasting Corporation (Radio and Television) together with the Jamaica Information Service are to be relocated at the Caenwood Complex where the CPTC is already located, thereby bringing all the public information facilities into one location. With all the Government's electronic media facilities in one location, engineering, maintenance and purchase of equipment can be rationalised and programming will be integrated.

●● This exercise will be funded from the proceeds of sale of the JBC buildings.

RELIGIOUS TV — a licence will be granted for islandwide broadcast of religious television. This licence will be granted on the same basis as the Commercial TV licence. That is, the licensee will be responsible for funding all his operating equipment. The terms and conditions of the licence will be developed with the Broadcasting Commission, taking into account the criteria for the religious radio broadcasting licence.

●● Licensees for the private stations will be chosen not only for their ability to raise the necessary capital to finance their venture but on their management ability and the production putting together an information package which prospective feasibility of broadcasting. Interested parties may address their enquiries to the Chairman of JBC.

RJR The RJR divestment programme will be as follows:

●● With regard to the "A" shares currently held by the National Development Bank — (a) Existing "A" shareholders who have not yet taken up their full allocation will be offered the opportunity to acquire such shares up to their full quota of 6% of the total "A" shares. The Chairman of RJR has been advised of this decision.

(b) If any unallocated "A" shares remain, that is after the requests of all organisations have been satisfied up to the 6% quota limit, these shares should be offered to those shareholders who have already taken up their full 6% quota, up to a limit of 10% of "A" shares in respect of each organisation.

●● As regards the "B" shares held by the Accountant General — (a) the 25.1% holding of the Government is to be reserved for a public offering to be made before the end of this year.

(b) no single entity or connected entities will be permitted to hold more than 10% of the total number of "B" shares outstanding.

●● As far as is appropriate, the licences to be granted will have similar terms and conditions, including that for RJR. There will continue to be a requirement for private stations, both radio and television, to allow time for government broadcasting so that important information will be certain to reach the public.

The Broadcasting Commission is putting in place the necessary administration structure to monitor closely observance of licences. Thus with a greater number and increasing diversity of stations will come a greater responsibility on the part of operators to adhere to the terms of their licences. The penalties for non-compliance will be set out in the licences.

●● Licence fees in the case of all commercial broadcasting entities will be set at 2½% of gross revenue. In consultation with the Broadcasting Commission, a formula for setting the licence fee for religious broadcasting will be devised.

●● Foreign investment is not desirable in the ownership of the media and therefore would not be considered.

●● Applications for licences are to be made to the Office of the Prime Minister, c/o The Permanent Secretary.

●● The Time Table of the divestment process to completion and commencement of operation is set out below.

Implementation schedule

Table of Ministry Paper in Parliament — August 11.

Receipt of Applications for Licence — Radio 1 and TV — August 21.

Finalisation of Prospectus — RJR "B" Shares — September 14.

Selection of Licensees for Radio 1 and TV — September 21.

Selection of Licensees for Radio 1 and TV — September 21.

Award of Licence for Regional Radio — September 28.

Award of Licence for Regional Radio — September 28.

Selection of Licensee for Religious Broadcast Radio and TV — October 13.

Public Offering — RJR "B" Shares — October 26.

Award of Licence for Religious Broadcast Radio and TV October 29.

Start up operations by

(1) Commercial AM/FM — October 1, 1987.

(2) PBS Radio — November 1, 1987.

(3) Commercial TV — December 1, 1987.

(4) PBS TV — December 1, 1987.

(5) Commercial Regional Radio — January 1, 1988.

(6) Religious Radio — February 1, 1988.

(7) Religious TV — April 1, 1988.

Kingston THE DAILY GLEANER in English 1 Aug 87 p 1

[Text]

PRESIDENT of the People's National Party, Mr. Michael Manley, has said that the JLP should rethink it's media divestment policy or else they would not be going along with certain aspects of it, if and when they come into power.

Addressing his first public meeting, after illness, at North Parade, Kingston, on Wednesday night, Mr. Manley said he was fit and ready for general elections.

Mr. Manley said he believed in competition in the media, for it meant better news services, cultural and educational programmes that what was not needed were programmes from abroad that did not reflect local lifestyles, and do not let Jamaicans know who they are

He said there was a place for the private sector, for example the **Gleaner**

"I have no quarrel with it, it has it's proper place in Jamaica.", he said

There was also a place for a kind of medium not concerned with what the shareholders think, that was why the PNP Government had set up Radio Jamaica on a basis where trade unions, nurses and churches, among other locals could be part of the Board of Directors, he said

Mr. Manley said no one person should try to twist Radio Jamaica to it's own interest. It was there to serve the nation with impartiality and fair play, and had done this magnificently

Mr. Manley said "People believe in it, it is doing a good job, what the hell are we troubling it for."

He said Government did not have popular support in what they were planning for media divestment policy

Mr. Manley was referring to the Prime Minister's announcement that three television stations and four new radio stations would be put in place by April next and that the 25% Government holding in RJR would be divested by the end of the year.

Mr. Michael Manley, in regard to JBC, said his father (National Hero Norman Manley, who spearheaded JBC) envisaged it as a public station

Mr. Manley said his thinking was that a formula be found, similar to that of the Electoral Committee, where it remained a public concern, but no Government or political party could manipulate it.

In the media, he said, there was a role for the private shareholding medium, institutional medium like RJR and a public medium like JBC

In regard to the Government's media divestment plan, he said "what you are doing, I don't accept all of it, because you don't have the authority of the people."

He was glad to see a channel for religious services, but he would not be going along with any such station being owned from abroad. All Jamaican churches should have a full voice in it or he would be forced to change this, he said

9274

CABLE AND WIRELESS TO BUILD $10-MILLION SATELLITE LINK

Castries THE VOICE in English 1 Jul 87 p 12

[Text]

ST LUCIA's international telecommunications links will benefit from a major project about to be implemented by Cable & Wireless (WI) Ltd.

Planning permission has been obtained for the erection of a 15.5 metre dish antenna here, which will provide St. Lucia with its own direct links to the international satellite system, Intelsat. At present all our international links have to be routed via the Antigua or Barbados satellite stations.

Work on the earth station, which is designed to withstand winds of 200 miles per hour is due to commence next month. It is a turnkey project which was awarded to GTE of the US, who won the contract at international tender.

The project will require retraining of local staff by GTE and is expected to be completed in April 1988, at a cost of EC $10 million. Additional building and civil works will substantially increase the final cost of the project to well over this figure, Cable & Wireless said.

St. Lucia's new earth station will be fully digital, and St. Lucia will be the first C&W location, worldwide, to utilise such a system. Apart from offering better quality and increased reliability on 120 voice circuits, the system will also carry one international TV transmit and receive channel.

"Events of international importance, such as last July Pope's visit, will no longer require special arrangements in order to be telecast internationally. This is in contrast to satellite stations widely used for TV reception, which are 'receive only' stations on US domestic satellites," a company spokesman said.

The introduction of this facility will increase St. Lucia's attractiveness as an offshore data entry location. These locations are in increasing demand as they offer cheaper employment rates than the host country. The earth station will therefore have a job creating potential in the wider St. Lucia context, in addition to some direct employment within C&W.

On a regional level, the St. Lucia earth station will provide additional diversity for sister territories in the Eastern Caribbean on their international outlets. St. Lucia is the 'hub' of most international traffic to/from the northern and southern Caribbean islands which now use Barbados or in some cases Antigua, as international gateways. The Eastern Caribbean microwave system, which runs from Tortola to Trinidad, including the French islands, provides the telecommunications lifeline up and down the chain.

As part of the co-ordinated approach to regional telecommunications being undertaken by C&W, this link is also being replaced by an up to date digital microwave system. The St. Lucia transit stage has already been completed - calls to and from Vieux Fort are carried on this link, which incidentally is the longest of its type in the world.

BRIEFS

COMPUTER CONTRACT WITH FRG--Kingstown, Aug 23, CANA--St Vincent and the Grenadines Government has signed a contract worth EC$1.5 million with the British firm, International Computers Limited (ICL) to complete the computerisation of the operations of the country's public service. [Text] [Port-of-Spain TRINIDAD GUARDIAN in English 24 Aug 87 p 5]   /8309

CSO: 55400003

BRIEFS

FIRST FULLY AUTOMATED MOBILE PHONE SYSTEM--Ericsson Radio System has signed a preliminary contract valued at 78 million [Swedish] kroner for the sale of a mobile telephone system to Venezuela. Work on the system will start in 1988, and in the first phase will cover Caracas, the capital. According to the order, Ericsson is to deliver an AXE switching station and ten radio base stations. Venezuela will be the first country in Latin America to get a fully-automated mobile telephone system. [Text] [55002403a Stockholm DAGENS NYHETER in Swedish 23 Sep 87 p 14] /9274

COMPTROLLER CRITICIZES TELECOMMUNICATIONS DEPARTMENT

55500007 Calcutta THE STATESMAN in English 20 Aug 87 p 3

[Text]

THE Union Government's Department of Telecommunications has been criticized by the Comptroller and Auditor-General of India in its recently published report for the year 1985-86. The report has noted with concern that the "total number of telephone lines has been falling short of the targets year after year leading to an increase in the number of applicants on the waiting lists".

It has been pointed out that during 1985-86 targets could not be met in the laying of underground and coaxial cables, in the installation of telex capacity and in setting up of new telegraph offices. In many cases, equipment had been installed but could not be operated as the cables were yet to be laid. The Auditor and Comptroller-General has held the department's "faulty planning" responsible for the non-realization of the targets.

Except for Calcutta, the number of persons on the waiting list for new telephones has been steadily increasing in all the three other metropolitan cities. In Bombay, this number has risen from 153,000 in 1981-82 to 181,000 in 1985-86. During the same period, the number rose to 155,000 from a mere 27,000 in Delhi. In Madras, the number was 91,000 in 1985-86, against 31,000 four years earlier. Only in Calcutta, it has come down to 25,000 from 90,000 in 1981-82.

The shortfall in setting up telephone facilities in respect of plan targets together with underutilization of equipped capacity has resulted in a drop in the realization of telephone revenue.

The report said that a test check of the audit of telephone revenue accounts in 33 telecommunication circles and districts revealed that there was non-billing in 2,072 cases involving Rs 11 lakhs. Short-billing was also noticed in 2,902 cases involving about Rs 61 lakhs.

The report has listed major cases of under-assessment of revenue in the Delhi Telephone district, Karnataka circle, North-West circle, Madhya Pradesh circle and the TP circuit provided to news agencies between Jabalpur and Satna; and Jabalpur and Katni. Cases have also been mentioned of short recovery due to non-application of revised rates of rentals in respect of PABX boards, telephone connections and speech circuits.

Non-billing or short billing has also come to light in respect of circuits leased to Railways. No revision was made of the rental charges of teleprinter circuit leased to the Central Railways. Rent was not recovered from the Army authorities in another major case and incorrect levies of STD pulse rates between Panipat and New Delhi led to a loss of revenue amounting to Rs 31.11 lakhs. The department also suffered revenue losses due to delay in providing underground cable to the Indian Air Force in Bihar.

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MINISTER FEARS MISUSE OF SECOND TELEVISION CHANNEL

55500010 Calcutta THE STATESMAN in English 31 Aug 87 p 13

[Text]

THE Union Information and Broadcasting Minister, Mr Ajit Panja, has said that the second channel of Calcutta Doordarshan, to be commissioned in September next, would not be handed over to the State Government in the country's "interest", reports PTI.

Speaking at the Tollygunge station of the Metro Railway station in Calcutta on Sunday, Mr Panja said that when the Chief Minister, Mr Jyoti Basu expressed "more confidence" in the news coverage of foreign media, like the BBC or Voice of America, than the national media, "how can we believe that the State Government will not misuse the second channel?"

Mr Panja said that he was surprised to read the statement of Mr Basu that the BBC coverage was more reliable than the national media. It was regrettable that Mr Basu could rely on foreign media which had tried to crush the nationalist movements in Africa and the Third World by projecting all kinds of "misinformation" in their coverage.

Mr Panja urged the Metro Railway to complete the remaining work before 1990 to avoid further cost escalation.

Mr Panja, who travelled by the Metro on Sunday, said that Rs 500 crores had already been spent on the railway, and the stretch of Metro work between Esplanade and Belgachia should be completed as early as possible.

A Staff Reporter adds: Doordarshan will soon introduce a news programme for the deaf and the mute. An experiment on this has already been made. The programme, based on sign language, to be telecast twice a month, is designed to help the handicapped "establish rental ties" with the people of the country. Mr Ajit Panja, Union Minister of State for Information and Broadcasting, announced this while inaugurating the All-Bengal Handicapped People's Conference in Calcutta on Sunday.

He said there were about 15 million deaf and mute people in the country. He urged the handicapped not to lose heart nor consider themselves to be a social burden, since 80% of such cases could be prevented by using scientific techniques.

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REMOTE SENSING SATELLITE LAUNCH FOR JANUARY

55500008 Bombay THE TIMES OF INDIA in English 23 Aug 87 p 7

[Text]

BANGALORE, August 22.

THE Indian Remote Sensing Satellite, IRS-IA, will be launched by the Soviet Union in January, said Prof. U. R. Rao, the chairman of the space commission, here on Thursday.

He informed reporters that the flight model of the satellite was being integrated. After its sub systems were tested, it would go through simulation tests. The satellite was scheduled to reach the launching pad by December. Concluding work will take an additional 40 days.

Prof. Rao said the technology used in the IRS-IA was comparable to the latest in the series of LANDSAT satellites for remote sensing. In fact, the technology used was similar to that in the French satellite, SPOT.

The IRS-IA would have two very high resolution cameras, including some with a multi-spectrum facility. The bands had been carefully selected, keeping in mind the needs of the user services.

Areas like ground water mapping, mineral scouting, wasteland monitoring and forestry would be explored using satellite imagery. For this purpose, sophisticated software systems were being developed, he said. In the second phase of remote sensing technology, the space department would be able to identify certain species of trees. This technique had already been tested in the Yellapur forest.

States like Karnataka, Andhra Pradesh, Maharashtra, Gujarat and Rajasthan had already used satellite imagery for groundwater mapping. Bihar and Madhya Pradesh, too, sought

the same facility. In Gujarat, the mapping of groundwater potential had been successful. Only 10 per cent of the borewells had failed.

Prof Rao said that the INSAT-IC was likely to be sent into orbit by the Ariane launcher from Kourou by June, 1988. The INSAT-ID would go up in the Delta launcher in April, 1989. This would be the first commercial launch by Delta.

The second development flight of the augmented satellite launch vehicle (ASLV) will take place in February or March, he said.

Meanwhile, the first regional remote sensing service centre (RRSSC) was inaugurated here on Thursday by Prof Rao.

The Bangalore centre is the first of five such centres being set up under the National Natural Resources Management System (NNRMS) in the country. The other centres would be located at Dehra Dun, Nagpur, Jodhpur and Kharagpur. Each centre would cost Rs. 2 crores.

The RRSSCs would enhance, analyse and classify the digitally formatted data received from satellites.

A central management office (CMO) has been functioning at Bangalore for the overall management and co-ordination of the RRSSCs. In addition to these centres, associate centres are also being set up by the department of environment and forecasts at New Delhi. A Remote Sensing Application Centre will be set up at Lucknow and an Institute of Remote Sensing will be affiliated to the Anna University at Madras.

Prof Rao said all the five centres would be ready by the end of this year.

, 7358

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ORISSA TO EXPAND TELECOMMUNICATIONS NETWORK

[Text]

Bhubaneswar, Aug. 30 (PTI): The telecommunication network in Orissa is set for major expansion with Rs 100-crore investment for the Seventh Plan period, according to Mr R.M. Rai, general manager, telecommunications (Orissa).

Mr Rai said his department had proposed to open 140 new telephone exchanges and provide about 20,000 new telephone connections during the Seventh Plan against 108 exchanges and 10,656 connections provided during the Sixth Plan.

. The major telecommunications development schemes for the current plan include automatisation of the Sambalpur manual exchange (1800 lines) by installing a 2,500 lines automatic exchange, expansion of the capacity of Max-I exchanges at Bhubaneswar, Cuttack, Rourkela and Berhampur, construction of Cuttack-Dhenkanal,

Visakhapatnam-Koraput-Jeypore and Cuttack-Smbalpur microwave links and automation expansion of all 13 district headquarter exchanges.

Besides expansion of Max-II exchanges at Choudwak, Jagatpur, Bhawanipatna, Puri, Paradip, Bolangir, Angul, Bhadrak and Balasore, opening of eight new telex exchanges and expansion of telex exchanges at Bhubaneswar, Balasore, Koraput and Paradip and connection of all district headquarters with the state capital by subscriber trunk dialling (STD) system would also be taken up.

Mr Rai said an electronic digital trunk automatic exchange at Cuttack would be installed with which 14 important stations would be connected for gaining access to the national subscriber dialling system system (NSD)

With the commissioning of the

TAX (trunk automatic exchange—digital electronic) at Cuttack this year, the stations which would get access to the NSD are Cuttack-Choudwar-Sagatpur system, Bhubaneswar, Sambalpur. Rourkela, Balasore, Baripada, Chatrapur, Dhenkanal, Koraput, Paradip, Puri, Jeypore, Bhadrak and Angul.

The Cuttack TAX would also have direct linkage with the TAX systems in Calcutta, Madras, Ranchi, Raipur.

A unique aspect of the expansion programme would be, he said, a proposal to provide tele-link in 20 villages, vulnerable to floods and cyclones, in the Kendrapara sub-division of Cuttack district by utilising the access radio relay system (ARRS) and public telephone facilities. This would be the first experimental scheme of its type in Orissa for which the equipment was being imported.

/7358

INDIGENOUS AUTOMATIC EXCHANGES TO GO ON MARKET

55500009 Madras THE HINDU in English 27 Aug 87 p 17

[Text]

THOUGH the attitude of the Tata Corporate Group towards the indigenous telecom technology of the Centre for the Development of Telematics (C-DOT) may seem ambiguous the National Radio and Electronics Company Ltd (NELCO), a group company, has demonstrated its commitment to the indigenous efforts by putting on the market two digital EPABX systems based on the C-DOT technology earlier this month. The products are NELPAX 064 and NELPAX 0128, 64-port and 128-port PABX systems respectively.

Low line capacity system

Of all the 40-odd companies licensed to manufacture EPABX systems of C-DOT know-how only NELCO has so far been pragmatic in putting out a 64-port/line system even though the base module of the C-DOT technolgy is a 128 port system. It is, of course, true that to manufacture a lower line capacity system is straight forward: but to put it out as a packaged product requires a certain market sense if one wishes to compete with the foreign companies which have been allowed by the Department of Telecommunications (DOT) to dump their old analogue systems in the lower end of line capacities.

Both NELPAX 064 and NELPAX 0128 are based on Pulsed Code Modulation (PCM) and Time Division Multiplexing (TDM) concepts as opposed to the analogue concepts of Pulsed Amplitude Modulation (PAM)/TDM used by most of the imported systems in the 0-100 line capacity range. These digital concepts are inherent in the technology transferred by the C-DOT because its entire R&D strategy has been geared to the development of digital switching systems (DSS) for large capacity exchanges. The 128-port PABX, the 128-port Rural Exchange (RAX) and the 512-port exchange being put up this month at Delhi Cantonment have all been successful offshoots of C-DOT's integrated approach to telecom development in the country. Such an approach has enabled the C-DOT to establish a vendor network ensuring uniformity of components. After sale maintenance and service then is easily assured because of ready availability of components.

As of now it is only the microchip hardware that is yet to be totally indigenised. The imported hardware that C-DOT uses are an 8-bit CMOS 6502 microprocessor for interface controller, a 16-bit 68000 microprocessor for module control unit and messaging functions and a CODEC HD 44233 microchip for analogue/digital conversions. Currently all the companies which manufacture C-DOT systems buy these components from the ET&T through which the import of these is canalised. However, it is learnt that the Semiconductor Complex Ltd, Chandigarh, has already begun to manufacture the CODEC chips and within 15 months it aims to market the microprocessor chips as well. SCL which is already a C-DOT approved vendor for several other components, will then supply these chips directly to companies like NELCO.

Being part of such an integrated approach to the national telecommunication programme has its obvious advantages. Interfacing with the new digital main exchanges that will be soon phasing out the older systems will be facilitated as access to modified software that would be needed is assured because the C-DOT, as part of the technology transfer, ensures continued software support. Further upgradations of technology, as and when they happen, are immediately transferred to the licensed manufacturers of the C-DOT systems.

Again, as is basic to the C-DOT technology, the NELPAX systems are capable of operating in a non-airconditioned environment normally upto 35°C, and for short durations even upto 45°C. with humidity upto 95 per cent No imported system can claim these features which are essential for working in a typically Indian environment. One very interesting fact is that the C-DOT systems consume much less power than a foreign equipment of similar line capacities. This could be due to better design and use of more efficient devices in the system. Redundancy and diagnostics are built into the C-DOT systems. To ensure reliability all critical cards have been duplicated and diagnostic display is available on the operator console to identify where the fault is so that the problem can be immediately attended to.

Broadbanding facility

Broadbanding of the C-DOT technology and giving manufacturers like NELCO the status of OEM has enabled the companies to try out innovations on their own as well in a bid to capture the market because system features, extension features and operator features are common to all manufacturers using the C-DOT technology. For example, the NELPAX system has the Main Distribution Frame (MDF) within the cabinet itself for compactness. NELPAX systems have other modified features as well. The operator console has been modified from its

flat shape so that display in front of the operator is easily visible. The telephone has been shifted from the right to the left to facilitate writing while the operator receives a call. The receiver equipment that are offered with NELPAX systems are of rotary type or Siemens Dual Tone Multifrequency (DTMF) type though other shapes and designs are also provided if the customer so wishes.

NELCO's production line is complete with all the required automated assembly and testing equipment, wave soldering unit etc. The company has a licence to manufacture 20,000 lines per year and since commercial production is already under way NELCO expects to deliver within a month's time to its customers.

NELCO's officials are aware of the odds that even government establishments are putting up against promotion of indigenous technology. Several government departments' tender notices for EPABXs have insisted that the supplier

should have already supplied at least ten units to be acceptable by them, thereby automatically ruling out C-DOT manufacturers. But then there are also several customers committed to indigenous technology. This has given the much needed confidence to the C-DOT collaborators. And having got a major order from an industrial town complex, NELCO is geared up to face the onslaught of the multinationals.

One major competitor to NELCO is the newly formed Tata company, Tata Telecom Ltd., which has signed up with Oki Electric Company, Japan. The rationale for the Tatas, generally regarded as strong supporters of indigenous technologies, to follow such a division policy even within their own setup is not clear because the tieup is not restricted to higher line capacities alone. Therefore, whether the various Tata firms themselves will buy NELCO systems or Oki systems remains to be seen.

Science Correspondent

Knowhow for L & T

LARSEN and Toubro Limited will manufacture fully digital electronic private automatic branch exchanges (EPABX) in collaboration with the Centre for the Development of Telematics (C-DOT) which has developed indigenous state of the art technology in digital switching. This technology includes time division multiplexing pulse code modulation (TDM-PCM) with stored programme control (SPC).

Bombay Staff Reporter

BRIEFS

ELECTRONIC EXCHANGE MANUFACTURE--Silchar, Aug. 18: The department of telecommunications (DoT) has finally chosen the technology designed by the Centre for Development of Telematics (C-DoT) to manufacture the latest series of the electronic switching system (ESS II) exchanges, according to the Union minister of state for telecommunications, Mr Sontosh Mohon Dev. Mr Dev said the C-DoT technology would be "vastly cheaper" than that of CiT-Alcatel, the French telecommunications giant, which is setting up the two lakh line first ESS factory at Mankapur. He said the production cost of each line in a 5000-line ESS unit based on the CiT-Alcatel design would cost Rs 9000 against the average cost of Rs 6000 for each line in a C-DoT plant of equivalent capacity. He said the proposed second ESS factory would have an installed capacity of 5000 lines annually. Initially, a few components for this C-DoT designed set-up would be imported in a semi-knocked down (SKD) condition, but these would be indigenised soon. [Excerpt] [55500012 Calcutta THE TELEGRAPH in English 19 Aug 87 p 8] /7358

SUPARCO TO SUBMIT 'PAKSAT' PLAN BY DECEMBER

[Text]

ISLAMABAD, Aug 31 The proposal regarding launching of first Pakistani communication satellite into the orbit costing Rs 800 million would be submitted to the Cabinet by December for approval

Chairman, Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) Mr Salim Mahmud, told APP after delivering a lecture on "Space technology in Pakistan," at the Pakistan Science Foundation, here

He said, the proposal has been agreed in principle, adding that the Cabinet would decide about the funding share of the departments which would avail the facility.

He said SUPARCO has carried out feasibility studies. Of late the design work of the project "Paksat" has been completed, which would augment the existing telecommunication facilities to a great extent, he added

Mr Salim Mahmud added that thirty percent work of the project would be done by SUPARCO including the ground work

The Paksat would have two direct broadcast television channels for nationwide dissemination of TV signals for entertainment and education, Mr Salim Mahmud added

On a question, he said that hiring charges of two TV channels for 16 hours a day cost about dollars two million annually

The proposed domestic communication satellite will consist of two spacecraft — one operational and the other standby, he concluded —APP

/9274

FINLAND, SWEDEN IN WORLD'S FIRST INTERNATIONAL VIDEOPHONE NET

55002403b Helsinki HUFVUDSTADSBLADET in Swedish 25 Sep 87 p 12

[Unattributed article: "Conversation on Mobile Telephone to Stockholm"]

[Text] The world's first international videophone conversation over a public telecommunications net was placed from Helsinki to Stockholm on Thursday [24 September]. The conversation at the same time officially inaugurated the Postal and Telecommunication Agency's Diginet service.

Pekka Tarjanne, general director of the Postal and Telecommunications Agency, inaugurated the new videophone connection by calling up his Swedish colleague.

Diginet offers new capabilities for business teledata communications, including such things as rapid data transfer, videophone conversations and still more rapid telecopying. The system has already for some time been in use with telephone conversions and the Telecommunication Agency's local nets. It has also been tested in the long-distance net [in Finland]. The Service Office is to be expanded in pace with digitizing of the telephone net.

Diginet is a first-stage for the even more efficient ISDN multiservice net, which is a broad-band system based on optics technology. It will be brought into service in the decade of the 1990's.

On 24 September the Postal and Telecommunications Agency signed an agreement to buy the first domestic ISDN switching station. Helsinki Telephone Association has already begun to test a public digital ISDN net, which will be installed in the capital area. This net is among the first commercial applications of its type in Europe.

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STATUS REPORT ON EUROPE'S MANUFACTURING NETWORK

Luxembourg IES NEWS in English Jun 87 pp 3-7

[Article based on information supplied by British Aerospace on behalf of the project consortium: "Communications Network for Manufacturing Applications (CNMA)--Manufacturing Message Service (MMS)"]

[Text] The members of the ESPRIT project consortium include five user companies, British Aerospace who act as the prime contractor and provide the project manager, BMW, Aeritalia, Peugeot and ELF. The vendor companies comprise Bull from France, GEC [General Electric Company], Nixdorf, Olivetti, Siemens and ICL [International Computers Ltd.]. Additionally there is TITN [New Techniques for Information Processing] from France who are a systems engineering company, and the project's main subcontractor, the Fraunhofer IITB Institute, based in West Germany. Figure 2 shows the CNMA relationship with other organisations.

The application layer protocol for manufacturing (MMS) has been specified, implemented and validated by CNMA.

The first public demonstration of a protocol around which MAP (Manufacturing Automation Protocol) V3.0 will be based, was given at the 1987 Hannover Fair.

The following provides a summary of MMS and the use of it by CNMA.

The phase 1 CNMA Implementation Guide describes a 7 layer OSI protocol stack for use in the Industrial Environment. MAP V2.1 is a protocol stack that is also intended for use in industrial environments and is based on ISO protocols according to the Open Systems Interconnection Basic Reference Model (OSI/RM). However, in the MAP V2.1 profile international standards are not used for the protocols in the upper two layers of the OSI/RM; the reason for this is that such standards were not available at the time MAP V2.1 was defined and an interim, "proprietary", solution was specified called MMFS or "Memphis". During 1987 MAP is planning to migrate the version 3 which will, amongst other things, replace the "proprietary" upper layers with standard protocols. These upper layer protocols are not currently at international standard status.

An objective of CNMA is to work in advance of the formal MAP V3.0 work to encourage the development and acceptance of the relevant standards and contribute to the specification of MAP V3.0.

The following diagram illustrates the protocols specified in the CNMA Implementation Guide.

MMS - ISO DP 9506

FTAM - ISO DIS 8571

CASE - ISO DIS 8649, 8650

Presentation - ISO DIS 8822, 8823 (kernel)

Session - ISO IS 8326, 8327 (Full duplex, kernel)

Transport - ISO IS 8072, 8073 (class IV)

Network - ISO IS 8473

Logical Link Control - ISO DIS 8802/2 (class I, type I)

Medium Access Control + Physical

ISO DIS 8802/3 (10 base 5)

ISO DIS 8802/4 (10 Mbps broadband)

ISO DIS 8802/4 (5 Mbps carrierband)

The profile was selected to minimise the complexity of the implementations whilst maintaining the functionality required by real applications and retaining an OSI architecture. It has to be remembered that some implementations would be required to be provided on devices having limited bulk store, run-time memory and processing power e.g. numerical controllers and programmable logic controllers.

Options for implementation are provided at the top and bottom of the profile. These are the aspects which are of concern and apparent to users: What services do I get? What networks can I use?

CNMA currently uses Local Area Networks (LANs) as the means to link devices. Three types of LAN are allowed:

1) Carrier Sense Multiple Access with Collision Detection (CSMA/CD), operating at 10 Mbps with 500 m cable segments.

2) Token-bus, operating at 10 Mbps modulated onto a carrier-band cable system.

3) Token-bus, operating at 5 Mbps modulated onto a carrier-band system.

Providing a range of networks in the profile, allows devices to be specified to use the network which most suits the user's implementation requirements. The requirements will include consideration of: the topology which has to be

constructed; whether services have to share the same cable; the geographic area to be spanned; the installed base; cost and preferences, environment, etc.

In any application, CNMA allows any of its selected LANs to be combined to form a single logical network. This means that a device on one LAN can communicate with a device on any other LAN. Individual LANs are combined using devices known as "network level relays" or routers. In this environment, the individual LANs are referred to as subnetworks and the "logical" networks as simply the network.

Routers have two, or more, ports, one on each subnet, and protocols up to layer 3. The layer 3 protocol is responsible for receiving data on one subnet, deciding if the data are needed on another and transmitting them to that subnet if necessary. The following diagram illustrates a possible network structure.
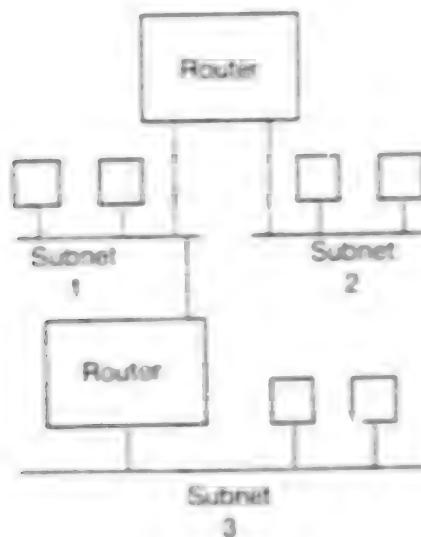

At layer 7 of the OSI/RM CNMA offers a choice of two application protocols: FTAM and MMS.

FTAM (File Transfer Access and Management) is a file transfer protocol suitable for manipulating files between computers.

MMS (Manufacturing Message Service) is a protocol for passing messages between programmable devices (such as numerical controllers or programmable logic controllers) and between programmable devices and computers. The purpose of this communication is to monitor and control the operation of the programmable devices and hence the manufacturing process.

It does not define a method for remotely generating the applications (remote programming). Features such as these may be added in future releases or defined in other protocols.

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```
        ┌──────────┐          ┌──────────┐
        │   File   │◄────────►│   Cell   │
        │  Server  │          │Controller│
        └──────────┘          └──────────┘
             ▲                     ▲  MMS Messages
             │              ┌──────┼──────┐
             ▼              ▼      ▼      ▼
        ┌──────────┐   ┌──────────┐  ┌────────────┐
        │  Robot   │   │ Numerical│  │Programmable│
        │Controller│   │Controller│  │   Logic    │
        └──────────┘   └──────────┘  │ Controller │
             │              │        └────────────┘
             ▼              ▼              ▼
          Robot        Machining        Sensors
                        Centre          Actuators
```
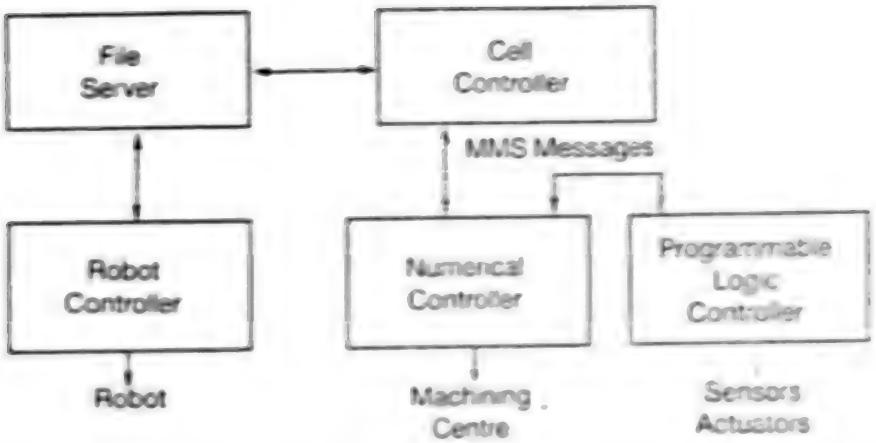
MMS assumes particular models of real world objects. For example there are models for: variables, files, events, semaphores and jobs. Each model can then be described by: a set of attributes; a set of operations which may be performed on the model; a collection of states the model may assume and the rules for moving between states.

Consider the simple model of a variable. Its attributes include: a name for the variable, its address, its data type, a security/protection parameter and its value. The operations which may be performed on the variable include operations to define a new variable, read the value and write to the value.

MMS defines:

1) the operations that can be performed on the models and the messages that need to be exchanged between systems to action the operations. E.g. for the operation "Read a Variable" two messages are required, one from system A to system B to request the value of the variable and the second for B to issue to A to enable it to respond with the actual variable value.

2) a protocol to control the transfer of messages between systems.

3) a notation for the abstract syntax of the protocol control information and messages that are exchanged between systems.

For the abstract syntax descriptions MMS makes use of the ISO document DIS 8824 - Specification of Abstract Syntax Notation one (ASN-1) for the description technique. Note that the presentation layer is responsible for converting this abstract syntax into a concrete syntax (byte encoding) for transmission.

MMS defines a peer to peer control, that is in any exchange of messages only two systems are involved and each have similar priority. The protocol is connection oriented, that is a logical association has to be established between the two systems before operations can be performed on objects. The protocol is responsible for establishing, maintaining and releasing the association and for controlling the exchange of messages between the systems.

The following diagram illustrates the MMS protocol state-table:
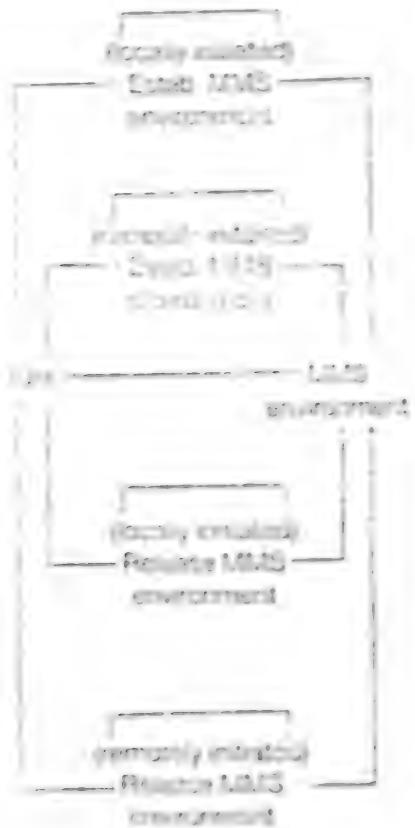
A wide range of operations and supporting messages is defined in MMS. Simple operations include reading and writing to variables whereas complex operations include defining event conditions in remote systems. Not all systems will need to use all of the operations, hence subsets have got to be defined which are useful and can be implemented.

The operations and messages do not define how "real-world" functions are achieved, e.g. how a robot arm is raised. This is intentional: MMS is a generic standard equally applicable to robot, machine tool and process controllers etc. It does not define any device or application specific material.

A separate set of standards, called companion standards, is needed urgently to supplement MMS and "tune" it to specific devices. The companion standards would define: the meaning to be attached to data; how MMS messages should be used to achieve the real-world functions and relevant subsets of MMS to be supported by particular types of device. Companion standards will be defined for: robot controllers, numerical controllers, process controllers, programmable logic controllers, cell controllers, etc. However, companion standards do not yet exist.

Part of the function of the CNMA Implementation Guide is to act as a companion standard for the devices to be used in the project pilots. MMS subsets and

the way to use them, have been defined for NC's (numerical controllers), PLC's and computers to support the manufacturing processes. ￼ funcionality provided allows: application programs in controllers to be l￼ad and reached for execution; the running and halting of such programs to be controlled and monitored; and for data variables to be read or written to.

An interesting requirement for the CNMA applications is the ability to down-load piece part-programs to numerical controllers. The part-program could have been generated by a CAE or CAD/CAM system and exists as a file on one of the computers. Such programs can vary in size from a few kilo-bytes to several Mega-bytes. These programs have to be loaded into the NC and executed. Different NC's have differing memory sizes and so need to handle programs in a way to suit their capabilities. For example, an NC with a large memory executing small programs could have the program completely memory resident and when loaded, begin to execute the program. An alternative would be for the same NC to execute a very large program, which could not be completely memory resident. In this situation the program has to be loaded into memory whilst it is being executed and is referred to as dynamic down-loading. This second method of operation is similar to trying to fill a bath with the plug removed: many litres of water can be poured in but (with care) the bath never overflows.

MMS provides three methods for loading programs into a controller from host computers:

1. If the program must be completely memory resident before it can be executed, MMS provides three operations: initiate down-load sequence,

transmit down-load segment and terminate down-load sequence. These operations are issued by the host, which holds the program, to the controller. The first operation puts the controller in a state to receive the program, the second transfers the program and the third puts the controller in a state where it can be commanded to start execution.

2. If the program has to be dynamically down-loaded, three MMS operations are provided: set incremental execute mode, incremental execute and set program mode. Again these operations are issued by the host, which holds the program, to the controller. The first operation puts the controller in a state where it will immediately execute any program segment it receives, the second transfers a program segment (this segment is then executed and the operation repeated until the whole program has been executed) and the third takes the controller out of the dynamic down-load state.

The previous two methods of using MMS require the host computer to be in control of the down-load procedure and contain the program. Hence, some knowledge is required, by the host, of the characteristics of the vendors controller and program so that the appropriate method can be used. The third method relieves the host of these concerns.

3. If the program has to be memory resident or dynamically down-loaded there is a set of four operations which allows the host to be unaware of the down-load process and for the program to be held on any other computer. The operations are: load from file, file open, file read and file close. Load from file is issued from the host to instruct the NC to ready a program for execution; when the controller indicates that this has been done the host will command the NC to execute the program.

The controller is then responsible for loading its own program. If the program is locally available, then it will be loaded from that source. If the program is to be fetched from a remote machine the controller issues a file open to the machine, to access the file holding the program, followed by a number of file reads, to fetch the program, finishing with a file close to close the file, after the program has been accessed.

The load from file operation runs in parallel with the file reading. If the complete program is to be memory resident, the controller only indicates completion of the load from file after the file close has been issued. If the program has to be dynamically down-loaded, the controller indicates completion of the load from file operation when it has read sufficient of the program into memory for execution to start; reading the rest of the program then continues as the program is executed.

The last method is the technique preferred and used, by CNMA because the host is independent of the controller characteristics and program location.

Figure 3 shows the control architecture demonstrated at Hannover.

CSO: 5500/A062

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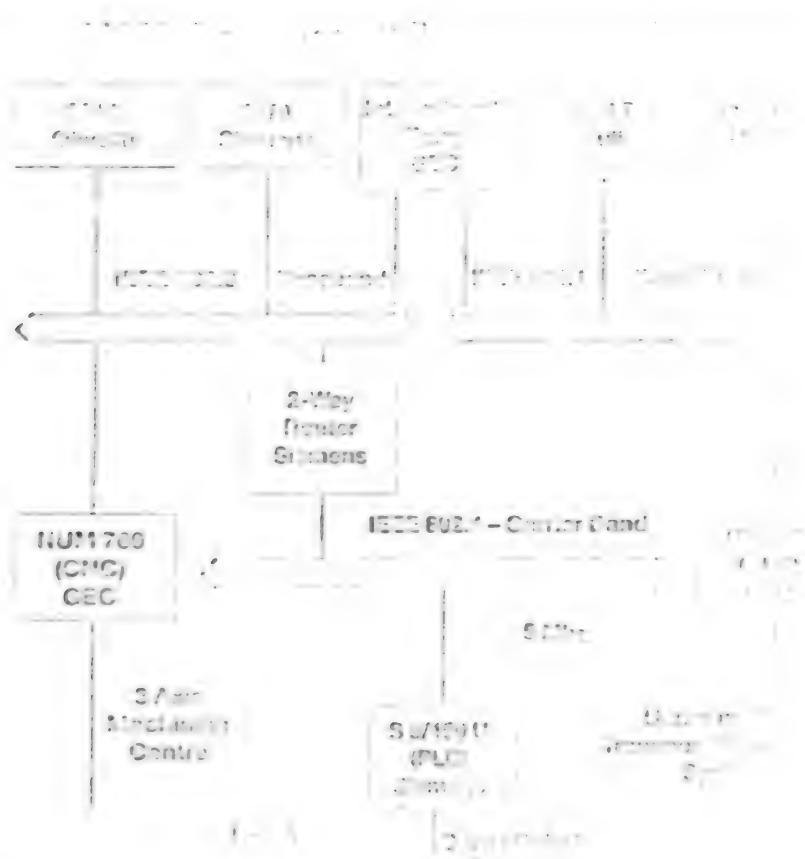
ESPRIT OSI ARCHITECTURE PROJECTS DESCRIBED

Luxembourg IES NEWS in English Jun 87 p 14

[Article: "The ESPRIT Projects CARLOS and CACTUS"]

[Text] CARLOS (Communication Architecture for Layered Open Systems) is a project in the Information Exchange Systems area of ESPRIT.

The project is carried out by RC Computer (prime contractor), CASE Communications, SYSWARE, and Fischer & Lorenz in cooperation with the two Danish Telephone companies--Copenhagen Telephone and Jutland Telephone.

The CARLOS project involves the development of a series of modular components which provide building blocks to construct OSI systems of varying sizes and sophistication to suit the diverse requirements and budgets of a large spectrum of potential users of OSI systems. The basic principle is to enable existing, common, de facto standard equipment (terminals and PC) to enter the OSI arena.

The project consists of the production of a number of components supporting the Virtual Terminal protocol and the File Transfer access and Management protocol at level 7. The OSI-BOX, the OSI-PAD and OSI-PC all support levels 6 and 7 of the OSI Model and the OSI-BOX provides the levels 1 to 5 support for the OSI-PAD and the OSI-PC. The CARLOS link layer exists between the OSI PAD/PC and the OSI-BOX. In addition there are all layer versions of both the OSI-PAD and OSI-PC.

The Network Management System is an integral part of the project and is based on emerging OSI principles and they will therefore have Entity Managers in all components. The complex mass of information that is required to be presented to a Network Supervisor can be simplified by means of the graphical Presentation System.

The CACTUS project (CARLOS Addition for Clustered Terminal User Agents) is an extension of the CARLOS project which has included new partners from Spanish Universities. CACTUS builds on the base of software and experience of CARLOS to implement the CCITT X-400 series of Recommendations. In the terms of the standards, such a device is a shared-resource user agent for clusters of terminals.

A CACTUS consists of VME-bus based hardware which supports personal computers which are primarily used as the user interface to a CACTUS. By means of an X-25 packet-switched network, the CACTUS is connected to either one or both of Private Interpersonal Messaging Systems, which includes more of itself and Public Message Transfer Services. The system is managed from a simple local terminal.

The user will utilise the PC for other functions and at intervals will log into the mailbox server which has been holding any incoming messages. These are then transferred to the PC's disc for perusal by the user. The user can also transfer messages prepared on the PC (probably using a standard PC word-processor package) into the Mailbox System Agent for onward routing via the MTA.

Simple terminals, such as those supported by CARLOS, can be supported in limited numbers via a user interface module within the CACTUS interfacing to the Mailbox Server.

By maintaining a path for existing devices to interface to the newer technologies, which is evolutionary and not revolutionary, we can make the migration as painless as possible. This encourages users to migrate earlier than they otherwise might have done.

For further information on CARLOS and/or CACTUS, please contact: Keld Sturup, Project Consultants, Skovlytoften 4, DK-2840 Holte, Denmark.

CSO: 5500/A062

LARGE EXPANSION FOR MOBILE PHONE SYSTEM PLANNED

Copenhagen BERLINGSKE TIDENDE in Danish 10 Jul 87 Sect III p 7

[Article by Henrik Damm: 'Mobile Phone Capacity To Increase by 500 Percent']

[Text] H. Hommfann & Sonner are going to set up eighteen stations at a cost
of 22.5 million kroner. Danish drivers are busy handling not only the traffic
on the highways, but also the traffic on NMT, the Postal and Telegraph
Administration's (P&T) mobile phone system. And interest is so great that
P&T is now going to expand capacity by 500 percent, from 56,000 subscribers
on 180 channels up to 300,000 subscribers on 400 channels.

Behind this huge expansion of the system stands H. Hoffmann and Sonner A/S,
Region North. The cost of the order from P&T's Construction Service will run
up to 22.5 million kroner.

The 31 base stations are to be set up in Helsingor, Frederikssund, Herstedvester,
Nykobing, Sjaelland, Ringsted, Mon, Vordingborg, Maribo, Nyborg, Snoghoj,
Sonderborg, Haderslev, Tonder, Svendborg, Skjern, Horsents, Tilst, Ebeltoft,
Silkeborg, Viborg, Lemvig, Lonster, Bronderslev, Frederikshavn, Randers,
Grindsted, Hobro and Varde.

The first eighteen stations are to be completed before the end of this year,
while the remainder are to be delivered at the end of 1988.

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27 Nov 1987